UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/573,551	03/27/2006	Guofu Zhou	NL 031171	7318

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EXAMINER
ZHOU, HONG

ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>27 March 2006</u>.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-10</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1,4-7,9 and 10</u> is/are rejected.

7)☒ Claim(s) <u>2-3, 8</u> is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>27 March 2006</u> is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All b)☐ Some * c)☐ None of:

      1.☒ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Priority

1.   Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers

have been placed of record in the file.

Claim Rejections - 35 USC § 101

2.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or
> any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and
> requirements of this title.

Claim 10 is rejected under 35 U.S.C. 101 because the claimed invention is directed to

non-statutory subject matter, specifically, a computer program that implements a method.

However, the claim is drawn to functional descriptive material, not claimed as residing on a

computer readable medium. To overcome this rejection, examiner suggests that this claim be

amended such that the functional descriptive material (both the program product and program) is

embodied on a statutory computer-readable medium.

Claim Rejections - 35 USC § 102

3.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on
> sale in this country, more than one year prior to the date of application for patent in the United States.

4.   Claims 1, 4-7, and 9-10 are rejected under 35 U.S.C. 102 (b) as being anticipated by

Zehner et al (US 2003/0137521).

Regarding claim 1, Zehner discloses an electrophoretic display device (26, Fig. 1; [0002],

lines 6-14) comprising at least one pixel cell (120, Fig. 3) and drive means (22, 24, Fig. 2;

[0049]) for driving said at least one pixel cell (120, Fig. 3) between a first extreme state (gray

level 0 or black, [0177]; Fig. 11]), a second extreme state (gray level 7 or white, [0177]; Fig. 11)

and at least two intermediate states (gray levels 1, 2, 3, 4, 5 and 6, [0177]; Figs. 11A and 11B);

said drive means ([0049]) being operative to drive each pixel cell by means of a drive

signal comprising a reset signal setting the pixel in a selected reset state (304, Fig. 8), and an

address signal setting the pixel in a target image state (306);

said display device (26) further comprising means (comparator, [0205], lines 11-12) for

estimating a level of remnant voltage in each pixel;

said selected reset state being selected as one of said extreme states depending on the

target image state (Fig. 11A, when the target image state is gray level 1, reset state is set to gray

level 0 or black state; on the other hand, when the target image state is gray level 6, reset state is

set to gray level 7 or white state) and depending on the estimated level of remnant voltage

([0205], lines 12-17; Fig. 11B; e.g., when the measured remnant voltage is positive after a pixel

undergoes 1-2 transition, a black-going pulse is applied to the pixel to drive the remnant voltage

to zero, therefore, a white state is selected as a reset state for 1-3 transition), such that excessive

remnant voltage levels are avoided ([0054]) while simultaneously limiting flicker occurring due

to different optical appearance of the target image state and the selected reset state ([0191], lines

9-16; minimizing flashing of the area; [0173], line 12).

Regarding claim 4, Zehner discloses an electrophoretic display device (26, Fig. 1, also

see [0002], line 7) according to claim 1, wherein the drive means ([0049]) comprises a look-up

table (124, Fig. 3; [0024]) and is operative to determine a desired flicker minimizing reset state (Fig. 11A, e.g., gray level 0 or black state is used as a desired flicker minimizing reset state when a pixel undergoes 0-1 image transition), to store information regarding preceding driving signal([0024]; Fig. 11A; e.g., the lookup table includes impulses 1144, 1116 and 1118 wherein the impulse 1114 and 1116 are preceding driving signals), and to select the reset signal (1118) from said look-up table based on said desired flicker minimizing reset state (black state) and on said preceding driving signals ([0027]).

Regarding claim 5, Zehner discloses an electrophoretic display device (26, Fig. 1, also see [0002], line 7)according to claim 1, wherein said intermediate states includes a first intermediate state (gray level 1, Fig. 11A) having an optical appearance that is close to said first extreme state (gray level 0 or black state, Fig. 11A), and wherein said first extreme state is always selected as reset state when said first intermediate state is used as target image state (e.g., both states 0-1 and state 3-1 have black state as reset state), such that flicker is limited without considering the build up of remnant voltage when addressing said first intermediate state (since the interval of gray between black state and gray level 1 is small, flicker is limited).

Regarding claim 6, zehner discloses a method of driving an electrophoretic display device (Fig. 8; [0002], lines 6-14), said display device comprising at least one pixel cell (120, Fig. 3) which is controllable between different image states including a first extreme state (gray level 0 or black, [0177]; Fig. 11]), a second extreme state (gray level 7 or white, [0177]; Fig. 11), and at lest two intermediate states (gray levels 1, 2, 3, 4, 5 and 6, [0177]; Figs. 11A and 11B); said method comprising the steps of: receiving pixel image information regarding a target image state to be displayed by the pixel ([0026]); estimating a level of remnant voltage in the pixel cell

([0053]), resetting the pixel to a selected reset state by means of a reset signal (304, Fig. 8),

switching said pixel from said selected reset state to said target image state (306, Fig. 8),

wherein, said selected reset state is selected as one of said extreme states depending on the target

image state (Fig. 11A, when the target image state is gray level 1, reset state is set to gray level 0

or black state; on the other hand, when the target image state is gray level 6, reset state is set to

gray level 7 or white state) and depending on the estimated level of remnant voltage ([0205],

lines 12-17; Fig. 11B; e.g., when the measured remnant voltage is positive after a pixel

undergoes 1-2 transition, a black-going pulse is applied to the pixel to drive the remnant voltage

to zero, therefore, a white state is selected as a reset state for 1-3 transition), such that excessive

remnant voltage levels are avoided ([0054]) while simultaneously limiting flicker occurring due

to different optical appearance of the target image state and the reset state ([0191], lines 9-16;

minimizing flashing of the area; [0173], line 12)..

Regarding claim 7, Zehner further discloses a method according to claim 6, wherein said

step of estimating (see [0052] and [0053]) a level of remnant voltage takes a driving history of

the display device into account (e.g., measuring whether the remnant voltage is positive or

negative after the first driving signal).

Regarding claim 9, Zehner further discloses a method according to claim 6, said method

further comprising the step of determining a desired flicker minimizing reset state (Fig. 11A,

e.g., gray level 0 or black state is used as a desired flicker minimizing reset state when a pixel

undergoes 0-1 image transition), storing information regarding preceding driving signals ([0024];

Fig. 11A; e.g., the lookup table includes impulses 1144, 1116 and 1118 wherein the impulse

1114 and 1116 are preceding driving signals), and selecting said reset signal (1118) from a look-

up table (124, Fig. 3; [0024]), based on based said desired flicker minimizing reset state (black state) and on said preceding driving signals ([0027]).

Regarding claim 10, Zehner further discloses a computer program implementing the method of claim 6 ([0148]).

Allowable Subject Matter

5.   Claims 2, 3, and 8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6.   The following is an examiner's statement of reasons for allowance: prior art of record fails to teach, or render obvious, alone or in combination, the limitation of "means for estimating a level of remnant voltage comprises a counting means, operative to count the number of consecutive times the same extreme state is selected as reset state" as required in claims 2, 3, and 8.

Conclusion

7.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Wilcox et al (US 2005/0179642) discloses methods for reducing the effects of remnant voltages in electro-optic displays.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HONG ZHOU whose telephone number is (571)270-5372. The examiner can normally be reached on Monday through Friday 8:30 A.M. - 5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Amare Mengistu can be reached on (571)272-7674. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would

like assistance from a USPTO Customer Service Representative or access to the automated

information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

HZ
Examiner
Art Unit 2629
                    /Amare Mengistu/
          Supervisory Patent Examiner, Art Unit 2629